REMARKS

Applicants respectfully request reconsideration of the above-captioned application. Claims 1-17 are currently pending. Claims 14-17 have been added to round out the scope of protection being sought and claims 1-4 and 6-7 have been amended to accommodate the concerns expressed in the Office Action, as further explained below.

The Office Action includes an indication that claim 10 has been withdrawn. Applicants respectfully note that claim 10 merely recites that an optical fiber is used for guiding light from the diode to the actual material, as opposed to another embodiment that has a lens for focusing the light, as shown in Figures 1 and 2. The manner in which the light is input to the active layer is not the primary focus of the present invention, and therefore it does not seem appropriate for a restriction requirement to be upheld. As previously argued, it is respectfully submitted that undue burden would not be imposed upon the Examiner by the concurrent examination of this one additional claim. Accordingly, Applicants repeat their earlier request that the restriction requirement be withdrawn and that this claim be rejoined with the application.

The Office Action includes a rejection of claims 1-4, 6 and 7 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Various phrases found objectionable by the Examiner have either been deleted or avoided in a manner believed to overcome the Examiner's concerns. For instance, claims 3 and 4 have been amended to separate the preferred values of the length of the chip of active material into dependent claims 14 and 15.

In light of the foregoing comments and claim changes, Applicants respectfully request reconsideration and withdrawal of this rejection.

The Office Action also includes a rejection of claims 1-6, 9, 11-13 under 35 U.S.C. § 103 as allegedly being unpatentable over the Thony et al. patent (U.S. Patent No. 6,023,479) in view of the Wu et al. article (Wu et al., "CO^{2+}:$MgAl_2O_4$ *Crystal Passive Q-Switches Performance at 1.34, 1.44 and 1.54 Micron*" *OSA TOPS, ASSL* (Davos, Switzerland) pp. 254, (February 16, 2000)); and a rejection of claim 8 under 35 U.S.C. § 103 as allegedly being unpatentable over the Thony et al. patent in view of the Wu et al.

article, and further in view of the Molva et al. patent (U.S. Patent No. 5,495,494). These rejections are respectfully traversed.

It is respectfully submitted that a person of ordinary skill in the art of microchip lasers would not, in an attempt to improve the microchip laser described by Thony et al., turn to documents relating to a high power laser having a pump power of 750 W (as in the Wu et al. article). A skilled person in the art would not view technical solutions for high power lasers as being compatible with microchip laser technology. For instance, the power consumption, bulkiness and need for active cooling of high power lasers cannot be accommodated for in a microchip laser. Rather, a skilled person would seek documents relating to lasers of similar powers (pump power of about 0.5 W). For this reason alone, it is respectfully submitted that one would not think to modify the Thony et al. device according to teachings found in the Wu et al. article, and the rejection should not be maintained. Stated differently, there would be no reasonable expectation of success in one trying to apply technics used in high pump power laser devices in the type of low pump power laser device of the Thony et al. patent and hence a *prima facie* case of obviousness has not been established. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

The bulkiness, the excessive power consumption and the need for active water cooling as disclosed by the Wu et al. device could not be implemented in a microchip laser. In this context, attention should be drawn to the specification on page 2, lines 27-30, where it is stated that one advantage of the present invention is that it can be battery powered and implemented as a portable, hand-held device. This is obviously not the case for a high power, water cooled device as that disclosed in the Wu et al. article.

Accordingly, it is also respectfully submitted that the only motivation or teaching for using a optically bleachable material comprising a cobalt-doped crystal of spinel type in a microchip laser is found in applicants' own teachings, and therefore it is respectfully submitted that the Office has digressed into the impermissible use of hindsight in formulating the rejection. *Id.*

To draw out this point in detail, to suppose one skilled in the art would look at the Wu et al. article for possible teaching relevant to the Thony et al. patent, he must overcome a number of hurdles:

- The person of ordinary skill in the art must realize how to adjust the doping content of the absorber to achieve a chip of optically bleachable material suitable for a microchip laser. It is not sufficient to reduce the size of the known absorber, due to the bending problem of spinel type crystals (see page 3, lines 31-32 in the specification). Crystal thickness and doping level are interdependent.

- He must realize how to solve the cooling issues, since water cooling is not an option for a microchip laser that should be portable.

- He must realize that the rod of laser material can be shortened from 6.5 cm down to a chip having a thickness of a few millimeters with maintained operation.

- He must realize how to drastically reduce the power consumption of the laser, in a manner such that it is still operative to emit eye-safe pulses of light. Notably, 30 pump diodes of 25 W output power each (as in the Wu et al. device) would have to be replaced by a single pump diode having a power of only about 0.5 W to meet the levels presented in the Thony et al device (not to mention the present invention).

In addition, the invention employs a moderate power continuous-wave pump laser (see page 7, lines 12-16), contrary to the high power pulsed pump lasers of the Wu et al. article.

These differences in structure indicate that although both references relate to lasers, the differences in structures and function, which are to be given greater weight, indicate that high and low pump power lasers are non-analogous arts. *See, e.g., Wang Laboratories, Inc. v. Toshiba Corp.* 993 F.2d 858, 26 USPQ2d 1767 (Fed. Cir. 1993)(Single In-line Memory Modules (SIMMs) for use in personal computers not necessarily in the same field of endeavor as SIMM for an industrial controller due to memories of varying sizes can be added and replaced, as opposed to compact memory modules.) See MPEP 2141.01(a).

In summary, there is nothing in the cited documents suggesting that the spinel type saturable absorber disclosed in the Wu et al. article can be employed in a microchip laser configuration. On the contrary, the high pump powers (and the elaborate cooling scheme) used by Wu et al. indicate the opposite. Furthermore, numerous non-obvious measures must be taken in order to succeed, all of which suggest that the proposed combination of references is not appropriate to establishing a *prima facie* case of obviousness.

Claims 16-17 have ben added to emphasize one of the points made above, i.e., that the present invention involves a modest laser pump power.

In light of the foregoing, Applicants respectfully request reconsideration and allowance of the above-captioned application. Should any residual issues exist, the Examiner is invited to contact the undersigned at the number listed below.

Respectfully submitted,

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MARKED-UP CLAIMS 1-4 and 6-7

1. (Amended) A microchip laser arrangement, comprising

a first chip of active material operative to emit radiation in ~~[the]~~ a near infrared spectral region,

a second chip of optically bleachable material, which can be bleached by optical radiation in the near infrared spectral region,

a pump diode laser operative optically to excite said active material, and

a first and a second mirror enclosing said first chip and second chip, in order to form a resonant laser cavity,

wherein said optically bleachable material comprises a cobalt-doped crystal of spinel type.

2. (Amended) An arrangement as claimed in claim 1, wherein the active material comprises erbium-doped glass, operative to emit radiation at ~~[essentially]~~ 1.54 μm when optically pumped.

3. (Amended) An arrangement as claimed in claim 1, wherein the length of the chip of active material, in the propagation direction of the laser light, is smaller than about 5 mm~~[, preferably smaller than 1 mm]~~.

4. (Amended) An arrangement as claimed in claim 1, wherein the length of the chip of optically bleachable material, in the propagation direction of the laser light, is smaller than about 5 mm~~[, preferably smaller than 1 mm]~~.

6. (Amended) An arrangement as claimed in claim 5, wherein the laser diode emits light in a wavelength range between 940 nm and ~~[about]~~ 1000 nm.

7. (Amended) An arrangement as claimed in claim 6, wherein the laser diode is a InGaAs diode emitting light at ~~[about]~~ 970 nm.